**Genetics Unit Test**

Answer Key

|  |  |  |  |
| --- | --- | --- | --- |
| K/U / 20 | T/I /13 | A /6 | C /6 |

**Part I: Multiple Choice**

1. c

2. b

3. c

4. d

5. c

6. d

7. b

8. b

9. a

10. b

11. c

12. d

13. c

14. b

15. c

16. d

17. b

18. a

19. a

20. c

**Part II: Genetic Problems**

1. Communication /3

|  |  |  |  |
| --- | --- | --- | --- |
| Organism | # of chromosomes before meiosis | # of chromosomes during meiosis | # of chromosomes after meiosis |
| Human | 46 | 92 | 23 |
| Dog | 78 | 156 | 39 |
| Apple | 34 | 68 | 17 |
| Corn | 20 | 40 | 10 |

2. Application /2

Mitosis. The seeds produced by the new genetically engineered plant would likely be identical to the originally genetically engineered seeds. This is because a seed is a zygote- the results of fertilization of two gametes. Although genetically altered, the seed still reproduce through mitosis and, therefore, make copies of the genetically engineered genes.

3. Thinking and Inquiry /3

straight leaves: \_\_SS\_\_\_\_\_

crinkled leaves: \_\_Ss\_\_\_\_

curly leaves: \_\_ss\_\_\_

4. Communication /3

In order to determine whether the claimant is an imposter, Punnett squares will have to be drawn to determine the expected phenotypes for a cross between the parents

|  |  |  |
| --- | --- | --- |
|  | i | i |
| IA | IAi | IAi |
| IB | IBi | IBi |

Therefore, using the results of the Punnett square, it can be shown that it is impossible for parents with blood types AB and O respectively to have a child with blood type O. The claimant is an impostor.

5. Thinking and Inquiry / 2

Mutations lead to genetic variability in populations, increasing the chance for survival of individuals with unique traits in an ever-changing environment.

6. Application /4

Positive: If a person find out that they are a carrier for a disease that may be fatal, that person may decide not to have children.

If a person finds out that they have a greater disposition for a particular disease such as diabetes or heart disease, they can take many preventative measures to lessen the effects of the disease or even prevent it.

Negative: If a person knows that they have inherited a disease that will eventually end in severe disabilities and premature death, they may find it difficult to live with this knowledge.

If genetic testing is used to identify potential diseases in an unborn child, who is to decide what is a good set of genes?

7. Thinking and Inquiry /8

a) The parents are not affected by the disease and only ¼ of the children are affected. Thus the disease involves a mutated recessive allele. Because both females and males are affected, it is an autosomal trait and not a sex linked trait.

b) Because both individuals have a family member who had died from the disease, there is a 50% chance that they could be a carrier (Tt) and a 25% chance that they are homozygous dominant (TT).

If both are carriers (Tt) then there is a 25% change they will have a child who is homozygous recessive and is affected by the disease (tt).

If one parent is a carrier (Tt) and the other is homozygous dominant (TT), then there is no chance that the child will receive the disease. They will either be a carrier or homozygous dominant.

If both parents are homozygous dominant (TT), then there is not chance that the child will be affected by the disease, because neither parent would have transferred the mutated recessive gene.